Mr. Mike Romero
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ENVIRONMENT

Subject:
Outfall Basin 22 Investigation Work Plan
Chevron Willbridge Distribution Center No. 100-1868
ECSI No. 25

Date:
December 4, 2015

Contact:
Christopher Dotson

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Our ref:
B0045452.0009

Dear Mr. Romero:

On behalf of Chevron Environmental Management Company (CEMC), Arcadis U.S., Inc. (Arcadis) prepared this Outfall Basin 22 Investigation Work Plan (work plan) for the Chevron Willbridge Distribution Center No. 100-1868 (Chevron Willbridge Terminal), located at 5531 NW Doane Avenue, in Portland, Oregon (site). A site map is provided on Figure 1. This work plan was prepared following the City of Portland (the City) Bureau of Environmental Services (BES) *Outfall Basin 22 Dry-Weather Flow, Inline Solids, and Sediment Investigation Technical Memorandum No. OF-22-2*, dated July 2015 (technical memo; BES 2015) and provides a summary of the environmental regulatory framework at the site.

Regulatory Framework and Existing Controls

The Chevron Willbridge Terminal was placed on the Oregon Department of Environmental Quality (DEQ) Environmental Cleanup Site Information (ECSI) database in 1988 as "Chevron-Willbridge Distribution Terminal, Site ID #25." In April 1994, the DEQ issued a Consent Order (WMCSR-NWR-94-06 dated April 6, 1994; DEQ 1994) pursuant to Oregon Revised Statute 465.260(4) to Chevron U.S.A. Inc. Products Company, Shell Oil Company, and Union Oil Company of California (the Respondents [the owners of the subject properties in 1994]), collectively. In the Consent Order (DEQ 1994), the DEQ required that a remedial investigation (RI)/ feasibility study (FS) be performed (OAR 340-122-080), which included implementing an interim action plan and site characterization. The combined site (the Respondents' sites) is listed in the ECSI database as the Willbridge Bulk Fuel Area, Site ID #1549. The Willbridge Terminal Group

comprises the current owners (Chevron U.S.A. Inc., Phillips 66, and Kinder Morgan) of the Willbridge Bulk Fuel Area.

A portion of Portland Harbor, including the area adjacent to the Chevron Willbridge Terminal, was added to the National Priorities List in December 2000 as the Portland Harbor Superfund Site. The United States Environmental Protection Agency (USEPA), the DEQ, and other governmental parties entered into a Memorandum of Understanding (MOU). Under the MOU, the DEQ was established as the lead regulatory agency for upland investigations and the USEPA was established as the lead regulatory agency for in-water investigations. The *Portland Harbor Joint Source Control Strategy* ([JSCS]; USEPA and DEQ 2005) defines a process for identifying, evaluating, and controlling upland sources of contamination that potentially impact Portland Harbor. These source control evaluations under the JSCS (USEPA and DEQ 2005) are administered by the DEQ. The need to perform source control evaluations under the JSCS (USEPA and DEQ 2005) for the Willbridge Bulk Fuel Area have been included as part of the RI/FS process.

The Chevron Willbridge Terminal operates under a National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit. Stormwater runoff is collected in catch basins and roof drains and transported through underground conveyance lines. Stormwater runoff from the Chevron Light Products Tank Farm and the Chevron Lubricants Plant is discharged to the City of Portland storm drain system, with discharge to the Willamette River at Outfall OF-22 under a NPDES General 1200-Z permit (100122). Prior to 1982, surface water discharged though a 27-inch-diameter wood stave pipe with an outfall located between the Chevron and Phillips 66 docks. In 1982, this storm sewer was rerouted to Outfall 22, located to the east of the Phillips 66 dock, and replaced with 60-inch-diameter concrete pipe (Figure 1).

To prevent migration of separate-phase hydrocarbons (SPH) to the Willamette River, two groundwater containment walls and associated extraction wells were installed at the site and the adjacent Phillips 66 Portland Terminal. A sheet pile groundwater containment wall was installed around the 60-inch diameter Outfall 22 in 2001 to prevent ongoing petroleum product discharges. The 27-inch storm sewer was abandoned in place in 1982, but ongoing petroleum product discharges in that area led to construction of an additional sheet pile groundwater containment wall in 2006 (ARCADIS 2007). Extracted groundwater from behind both containment walls is treated at an oil-water separator on the Phillips 66 facility prior to discharge to the City of Portland sanitary sewer system under Industrial Wastewater Discharge Permit 500.015.

Stormwater runoff in the Chevron Terminal Dock Yard was formerly discharged to the Willamette River at a Chevron-owned outfall under a NPDES General 1200-Z

permit (107564); however, the Chevron Willbridge Terminal petitioned for exemption from this permit after truck operations in this area were discontinued in 2010. The permit is no longer active.

Several stormwater system upgrades were made by the Chevron Willbridge Terminal since 2010, which were summarized in *Summary of Additional Stormwater Best Management Practices and Source Control Measures* report to DEQ (ARCADIS 2014). These changes were also incorporated into the *Chevron Willbridge Terminal Stormwater Pollution Control Plan* (SWPCP; Chevron 2015) and summarized below in a letter to BES dated November 2, 2015.

- Installation of backflow preventers with remote shut-off capability in storm drain lines leading from the main tank yard to the loading racks.
- Installation of new storm drain piping, catch basins and a storm filter manhole in the loading rack area.
- Installation of a stormwater observation basin at the discharge point from the main tank farm.
- Installation of a hydrocarbon sensor and automatic shut-off valve from the depurator to the City of Portland sewer.
- Lining portions of the main tank farm and pipechase with bituminous geomembrane.
- Implementing annual site-wide catch basin cleaning, lot sweeping, and placement of hydrocarbon filters in catch basins (CEMC 2015).

Summary of BES Technical Memo

In its technical memo, BES discussed areas of the Outfall Basin 22 identified as potential sources of sheen to the Willamette River. These areas were determined through inspection and sampling at select locations within the Outfall Basin 22 which is comprised by storm sewers located along NW Front Avenue and NW Doane Avenue. The areas of concern discussed in the technical memo are shown on Figure 1 and summarized below.

Area 1 is located at the intersection of NW Front Avenue and NW Doane Avenue. The City storm pipe at this location includes lateral connections from City-owned catch basins located on NW Front Avenue, one lateral from the Chevron Willbridge Terminal (“CEMC Lateral #1”) and one lateral from the Phillips terminal (“P66 Lateral #1”). In this area, BES collected 3 sediment samples, 3 dry-weather flow samples, and 3 surface wipe samples.

Area 2 is located at the approximate midpoint along NW Doane Avenue between NW Front Avenue and NW St Helens Road. This section of the storm system includes one lateral from the Chevron Willbridge Terminal (“CEMC Lateral #2”)

and one lateral from the Phillips terminal ("P66 Lateral #2"). In this area, BES collected 2 sediment samples, 3 dry-weather flow samples, and 2 surface wipe samples.

Area 3 is located at the end of NW Doane Avenue, where the City storm system extends west towards NW St Helens Road. This area includes one lateral from the Chevron Willbridge Terminal ("CEMC Lateral #3"), one lateral from the Phillips terminal ("P66 Lateral #3"), and the upstream sewer pipe beyond the Chevron Willbridge Terminal which drain NW St Helens Road. In this area, BES collected 2 sediment samples, 4 dry-weather flow samples, and 4 surface wipe samples.

Area 4 is located along NW Front Avenue and drains a series of City-owned catch basins as well as connections to laterals which have previously been abandoned or are otherwise unused. In this area, BES collected 6 sediment samples, no dry-weather flow samples, and no surface wipe samples.

The technical memo included recommendations of proposed actions for the Chevron Willbridge Terminal. The proposed actions are generally consistent with the Best Management Practices proposed in the *Stormwater Source Control Evaluation Report* (SWSCE; Arcadis 2010) and implemented under the SWPCP. The following section describes additional work that CEMC proposes to perform as part of this work plan.

Distribution of SPH in Site Wells

As detailed in the *Groundwater Source Control Evaluation* report (GWSCE; Arcadis 2011), the extent of SPH at the site has been well characterized by the extensive monitoring well network and is depicted on Figure 2. The horizontal extent of SPH on site is well characterized by historical subsurface boring programs and through the monthly gauging program. Measurable SPH is observed in a limited subset of 29 monitoring wells, representing isolated areas of residual SPH. Although a subset of these wells are located adjacent to the NW Doane Avenue storm sewer (within Area 2 depicted on Figure 1) they are generally located downgradient of City-owned manholes and are not likely to be a source of SPH.

Proposed Investigation Activities and Anticipated Schedule

The following proposed investigations will address potential sources of dry-weather flow as well as potential sources of sheen through materials observed by BES in Chevron-owned manholes.

Dry-Weather Flow Investigation

Arcadis will oversee a dry-weather flow investigation at the three laterals identified in the technical memo (CEMC Lateral #1, CEMC Lateral #2, and CEMC Lateral #3). The inspection will require opening the associated City-owned manholes along NW Doane Avenue to visually inspect for potential sources of dry-weather flow. Depending on the results of the initial visual inspection at each manhole, a video scope may be placed into the manhole and a video scope of the associated Chevron laterals will be performed. Arcadis will provide photo documentation of these inspections and provide a proposed path forward for any additional inspection or maintenance based on observations. Arcadis will also provide discussion of the potential for known SPH at the site to enter the pipes.

Arcadis will not collect samples of observed dry-weather flow as part of these activities. Considering that BES collected dry-weather flow samples during their investigation, data gathered as part of additional sampling is not likely to provide a means to addressing the source and potential remedies to dry-weather flow within the system.

To investigate dry-weather flow conditions, Arcadis and CEMC will work with DEQ to identify an appropriate schedule for performing this work based on anticipated weather conditions.Considering that this work will require access to the City-owned manholes and storm pipes, this work plan assumes that permitting for access and regular coordination with BES will occur prior to the dry-weather conditions. Arcadis anticipates that this work will be performed in the first quarter 2016.

Manhole Vault Investigation

Arcadis will perform a visual inspection at the private manhole located on CEMC Lateral #2 for spent boom or other material to be removed. Although discussions with Chevron Willbridge Terminal staff in November 2015 indicated that the material has been removed since BES performed its inspection as part of the technical memo, this manhole will be inspected and maintained as needed.

Arcadis will also perform a visual inspection at two manhole vaults identified during a recent site visit at the north end of the Chevron Willbridge Terminal. These manholes were identified as potentially abandoned by Chevron Willbridge Terminal staff and Arcadis will perform an inspection to confirm their status.

Arcadis will provide photo documentation of these inspections and provide a proposed path forward for any additional inspection or maintenance based on observations.

Although the manhole inspections will be performed on Chevron-owned manholes, this work will be performed during the same mobilization as the previously discussed dry-weather flow investigations. Arcadis anticipates that this work will also be performed in the first quarter 2016.

If you have any comments or questions, please contact me by telephone at 503.220.8201 ext. 1121 or by e-mail at Christopher.Dotson@arcadis.com.

Sincerely,

Arcadis U.S., Inc.

Christopher Dotson

Project Manager

Copies:
Ken Theissen, DEQ
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Tim Bishop, Chevron Environmental Management Company
Jerry Henderson, Chevron Americas Products
Richard Soloman, Phillips 66 Company
Nick Giotta, Phillips 66 Company
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Enclosures:

Tables

1 Summary of Identified Areas of Concern and Proposed Actions

Figures

1 Stormwater System Map and Identified Areas of Concern

2 Historical Observations of SPH in Site Monitoring Wells

References:

Arcadis U.S., Inc. 2007. 2006 Annual Report, Willbridge Distribution Center No. 100-1868, ECSI No. 25.

Arcadis U.S., Inc. 2010. Stormwater Source Control Evaluation Report, Chevron Willbridge Distribution Center No. 1001868, 5531 NW Doane Avenue, Portland, Oregon. June 2010.

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City of Portland Bureau of Environmental Services 2015. Outfall Basin 22 Dry-Weather Flow, Inline Solids, and Sediment Investigation. Technical Memorandum No. OF-22-2, City of Portland Outfall Project, ECSI No. 2425. July 15.

Chevron Environmental Management Company 2015. Re: Outfall Basin 22 Dry-Weather Flow, Inline Solids, and Sediment Investigation, Technical Memorandum No. OF 22-2, City of Portland Outfall Project, ECSI No. 2425. November 2015.

Chevron Products 2015. Chevron Products, Americas Willbridge Terminal. Stormwater Pollution Control Plan, 5531 NW Doane Avenue, Portland, Oregon 97210, Multnomah County. February 9, 2015.

Oregon Department of Environmental Quality. 1994. Consent Order (WMCSR-NWR-94-06). April 6, 1994.

United States Environmental Protection Agency and Oregon Department of Environmental Quality. 2005, revised July 2007. Portland Harbor Joint Source Control Strategy. December 2005, Table 3.1 revised July 16, 2007.

Table 1
Summary of Identified Areas of Concern and Proposed Actions
Outfall Basin 22 Investigation Work Plan
Chevron Willbridge Distribution Center No. 100-1868
ECSI No. 25

Summary of Potential Concerns and Proposed Actions				
AREA 1	**Proposed Action**	**Performed by**	**Anticipated Schedule**	**Deliverables**
Dry-weather flow - Chevron lateral #1	Perform video scope to upstream Chevron MH to connection to new pipe[2]	CEMC	1Q / 2Q 2016[1]	Photo documentation of observations
AREA 2				
Dry-weather flow - Chevron lateral #2	Perform video scope to identify source of dry-weather flow[2]	CEMC	1Q / 2Q 2016[1]	Photo documentation of observations
Boom material in manhole on Chevron lateral #2	Inspect manhole and remove material as needed.	CEMC	1Q 2016[1]	Photo documentation of observations
AREA 3				
Dry-weather flow - Chevron lateral #3	Perform video scope to next upstream Chevron MH[2]	CEMC	1Q / 2Q 2016[1]	Photo documentation of observations
AREA 4				
No areas of concern associated with the Chevron Willbridge Terminal				

Notes:
1. Anticipated schedule is dependent upon access to City of Portland manholes located along NW Doane Avenue. Schedule is also dependant upon dry-weather conditions.
2. Potential actions and schedule following video scope work are dependent upon information gathered as part of initial inspection.

Approximate location of northern manhole vaults to be inspected

CHEVRON LUBRICANTS TANK FARM

LUBRICANTS FACILITY

LIGHT PRODUCTS TANK FARM

N. W. DOANE AVENUE

N. W. FRONT AVENUE

N. W. S T. JOHNS ROAD

MTD YARD

CHEVRON U.S.A. MARINE DOCK

TOSCO REFINING COMPANY MARINE DOCK

WILLAMETTE RIVER

OUTFALL 27 ABANDONED

TO CITY OF PORTLAND OUTFALL 22

SWCB-1 SWCB-2 SWCB-3 SWCB-4 SWCB-5 SWCB-6 SWCB-7 SWCB-8 SWCB-9 SWCB-13 SWCB-14 SWCB-16 SWCB-21 SWCB-22 SWCB-23

BES Upstream Lateral

CVX Lateral 3

CVX Lateral 2

CVX Lateral 1

P66 Lateral 3

P66 Lateral 2

P66 Lateral 1

Area 1
3 sediment samples - ND to 220 mg/kg (lube oil)
3 dry-weather flow samples - ND to 1.9 mg/L (diesel)
3 surface wipe samples - ND

Area 2
2 sediment samples - ND
3 dry-weather flow samples - ND to 130 mg/L (diesel)
2 surface wipe samples - ND to 290 mg/wipe (diesel)

Area 3
2 sediment samples - ND to 200 mg/kg (lube oil)
4 dry-weather flow samples - ND to 1.0 ug/L (PAHs)
4 surface wipe samples - ND to 420 mg/wipe (diesel)

Area 4
Six sediment samples - ND to 86,000 mg/kg (Lube Oil)
No dry weather flow samples collected
No surface wipe samples collected

0 200’ 400’
GRAPHIC SCALE

LEGEND:

- ABOVE GROUND STORAGE TANKS
- FORMER ABOVE GROUND STORAGE TANKS
- APPROXIMATE EDGE OF WATER
- STORM DRAIN
- ABANDONED STORM DRAIN
- API SEPARATOR DRAIN
- SWCB-1 = STORM WATER CATCH BASIN

SOURCE:

BASE MAP BY ALPHA ENGINEERING CONSTRUCTION, 2929 NW 29TH AVE, PORTLAND, OR., DATE 03-02-02, DRAINAGE & UTILITIES SYSTEMS PLAN, FIGURE 2, @ AN APPROX. SCALE ON 1" = 60'.

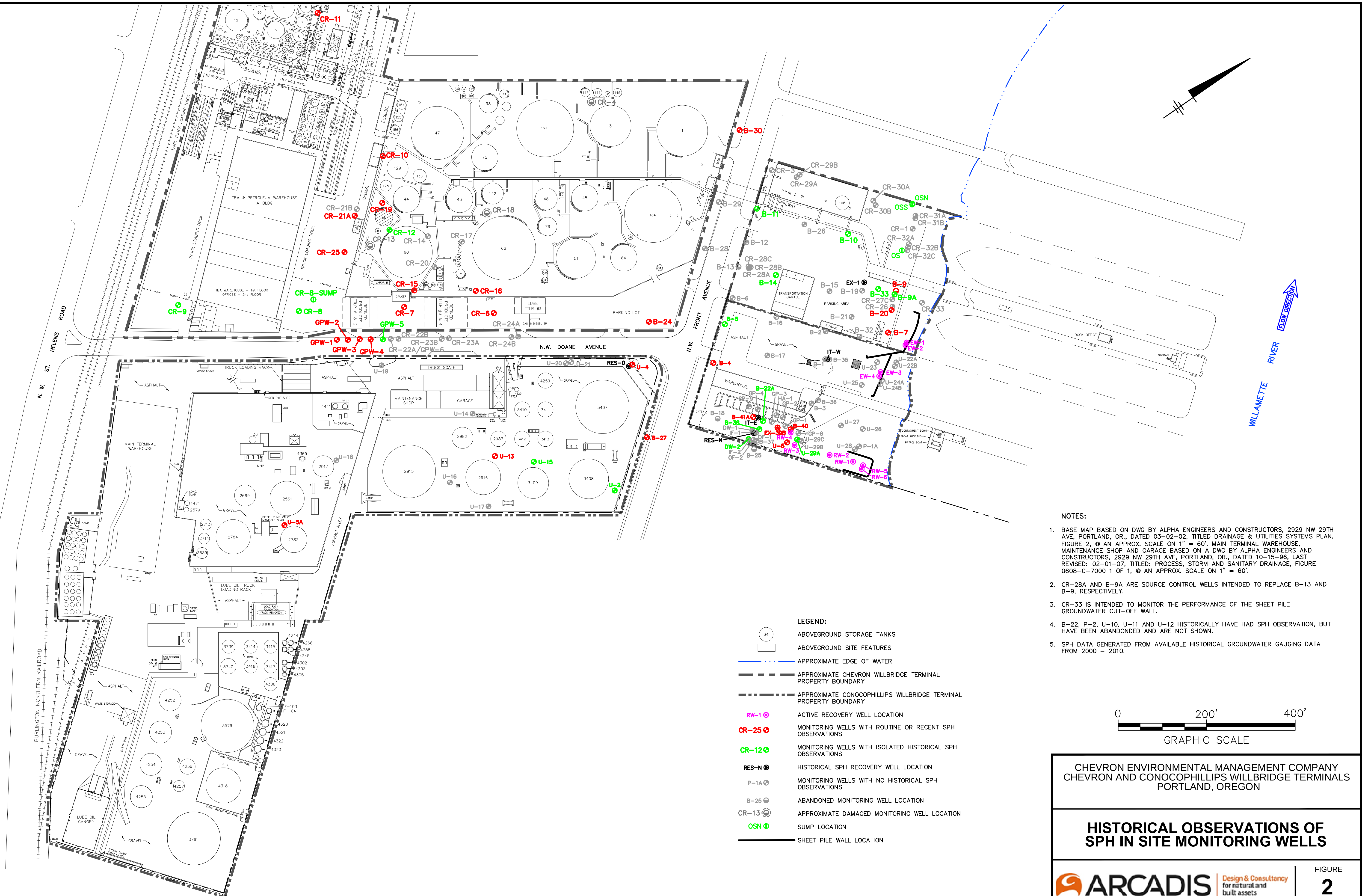
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
CHEVRON WILLBRIDGE DISTRIBUTION CENTER AND
CONOCOPHILLIPS WILLBRIDGE TERMINAL
PORTLAND, OREGON

STORMWATER SYSTEM MAP AND IDENTIFIED AREAS OF CONCERN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: (CARY, NC) SYRACUSE, N.Y. GROUP: ENVCAD-141 DB: (L. ELLIS), A.SCHILLING, P. LISTER, R.ALLEN PM/TM: G. SPRICK TR: J. NAIL LYR:ON=*;OFF=REF, (FRZ)
G:\ENVCAD\SYRACUSE\ACT\B0045452\0011\00287\DWG\GW-SCE-RPT\45452B24.DWG LAYOUT: 13 SAVED: 2/21/2011 1:03 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/21/2011 1:04 PM BY: ALLEN, ROYCE
XREFS: 45452XBL 45452X02 IMAGES: PROJECTNAME: ----



LEGEND:

64	ABOVEGROUND STORAGE TANKS
	ABOVEGROUND SITE FEATURES
	APPROXIMATE EDGE OF WATER
	APPROXIMATE CHEVRON WILLBRIDGE TERMINAL PROPERTY BOUNDARY
	APPROXIMATE CONOCOPHILLIPS WILLBRIDGE TERMINAL PROPERTY BOUNDARY
RW-1	ACTIVE RECOVERY WELL LOCATION
CR-25	MONITORING WELLS WITH ROUTINE OR RECENT SPH OBSERVATIONS
CR-12	MONITORING WELLS WITH ISOLATED HISTORICAL SPH OBSERVATIONS
RES-N	HISTORICAL SPH RECOVERY WELL LOCATION
P-1A	MONITORING WELLS WITH NO HISTORICAL SPH OBSERVATIONS
B-25	ABANDONED MONITORING WELL LOCATION
CR-13	APPROXIMATE DAMAGED MONITORING WELL LOCATION
OSN	SUMP LOCATION
	SHEET PILE WALL LOCATION

NOTES:

1. BASE MAP BASED ON DWG BY ALPHA ENGINEERS AND CONSTRUCTORS, 2929 NW 29TH AVE, PORTLAND, OR., DATED 03-02-02, TITLED DRAINAGE & UTILITIES SYSTEMS PLAN, FIGURE 2, @ AN APPROX. SCALE ON 1" = 60'. MAIN TERMINAL WAREHOUSE, MAINTENANCE SHOP AND GARAGE BASED ON A DWG BY ALPHA ENGINEERS AND CONSTRUCTORS, 2929 NW 29TH AVE, PORTLAND, OR., DATED 10-15-96, LAST REVISED: 02-01-07, TITLED: PROCESS, STORM AND SANITARY DRAINAGE, FIGURE 0608-C-7000 1 OF 1, @ AN APPROX. SCALE ON 1" = 60'.
2. CR-28A AND B-9A ARE SOURCE CONTROL WELLS INTENDED TO REPLACE B-13 AND B-9, RESPECTIVELY.
3. CR-33 IS INTENDED TO MONITOR THE PERFORMANCE OF THE SHEET PILE GROUNDWATER CUT-OFF WALL.
4. B-22, P-2, U-10, U-11 AND U-12 HISTORICALLY HAVE HAD SPH OBSERVATION, BUT HAVE BEEN ABANDONDED AND ARE NOT SHOWN.
5. SPH DATA GENERATED FROM AVAILABLE HISTORICAL GROUNDWATER GAUGING DATA FROM 2000 - 2010.

0 200' 400'
GRAPHIC SCALE

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
CHEVRON AND CONOCOPHILLIPS WILLBRIDGE TERMINALS
PORTLAND, OREGON

HISTORICAL OBSERVATIONS OF SPH IN SITE MONITORING WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2